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IRAC-IR&DC-7/74

5 December 1974

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THE INTELLIGENCE RESEARCH & DEVELOPMENT COUNCIL

MEMORANDUM FOR MEMBERS OF THE INTELLIGENCE RESEARCH
AND DEVELOPMENT COUNCIL

SUBJECT: Subcommittee Report on Research and Development
Applicable to Intelligence Processing, Analysis, and
Information Presentation

1. Following Mr. Goulder's subcommittee report to the Council at the 3 December 1974 meeting, the Chairman requested that the members review the attached proposal, identify key issues in areas under their cognizance, and comment attendant thereto at the 7 January 1975 session.

2. The attached documents which were circulated informally among the members in attendance at the 3 December meeting are forwarded for record purposes.

Executive Secretary

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Attachments:

Proposal for Review of R&D Programs Applicable to Intelligence
Processing, Analysis, and Information Presentation

Page from 22 July 1974 Report to the Chairman, IRAC, re Analysis

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PROPOSAL FOR REVIEW OF R&D PROGRAMS
APPLICABLE TO INTELLIGENCE PROCESSING,
ANALYSIS AND INFORMATION PRESENTATION

The costs and the volume of intelligence information acquired, processed, analyzed and disseminated demand a continuing effort to improve the effectiveness with which raw data are exploited and with which intelligence is presented to consumers. Effective application of R&D resources to processing, analysis and display problem areas is essential if the return expected from the major investment in collection is to be realized. A review of the use of R&D resources is proposed. This paper proposes objectives for such a review, identifies known problem areas and recommends a course of action.

Statement of Objectives

- Identify potential problem areas
- Survey recent significant technology development for application to processing, analysis and display problems
- Select for detailed review, problem areas that:
 - Appear to need cross program coordination, or
 - Have potentially high payoff for application of R&D resources, or
 - Can benefit from recent technology, or
 - Can otherwise benefit from Council support
- Prepare for Council review, recommendations resulting from these activities

Potential Problem Areas

- Image Processing
 - Digital Image Manipulation
 - Automated Pattern Recognition and Change Detection
 - Image Enhancement
 - Radar Imagery Exploitation

- SIGINT Processing
 - Automated Translation
 - "Exotic" Signal Processing
 - Signal Pre-Processing Selection and Conditioning
- ADP Technology
 - Queue Management
 - Associative Processing
 - Massive Memory Development
- Use of Analytical Techniques
 - Modeling
 - Simulation
 - Resource Allocation
 - Decision Analysis
- Data Presentation and Display
 - Crisis Management Requirements Impact
 - Essential Information for Decision Makers
 - Real-Time Interaction Techniques
- Data Communications
 - Electrical Data Distribution
 - Adaptive Transforms for Bandwidth Reduction
 - Computer/Network Internetting
 - Multi-Level Security
- Analyst Support
 - Interactive Analyst Terminal Progress
 - Common File-Retrieval Language
 - Distributed Data Base Programs

Recommended Actions

- Catalog and exchange information on current or planned R&D projects concerned with processing, analysis and display techniques.

- Survey recent significant technology development for application to processing, analysis and display problem areas.
- Select a few items from the problem area list which meet the review criteria. Suggestions are: Interactive Analyst Support System Developments; Exploitation of potential benefits available from application of computer-based analytical techniques to intelligence problems (i. e. resource allocation, analyst data evaluation, and decision-making processes); and Mass Memory Development and Application.
- For each item selected, conduct the review and document findings. The reviews will be structured by this Committee and the results reported to the Council.
- Prepare a register of additional problem areas worthy of review and proceed as above.

Attachment:
Detailed Problem List

DETAILED PROBLEM EXAMPLES

1. Processing
 - a. Digital image manipulation
 - b. Automated translation
 - c. Automated pattern recognition and change detection for imagery processing.
 - d. Electronic data distribution from collection to processing center as opposed to magnetic tape and hard copy distributed by mail and freight.
 - e. Can a common file -- retrieval language -- be developed that will permit its use for a variety of applications instead of our current approach of redesigning the system for each job?
 - f. R&D to automatically convert files to common vocabulary.
 - g. Automatic transformation of common access language to local file language to facilitate multiple user access to diverse file systems.
 - h. Adaptive transforms to reduce transmission bandwidth of information.
2. Exploitation and Analysis
 - a. Analytical Technique Development
 - (1) Dynamic Economic Modeling
 - (2) Crop Production Estimation
 - (3) Resource Intelligence Techniques -- Oil
-- Minerals
 - (4) Behavioral Modeling

(5) Policy Analysis -- Bureaucratic Behavior
-- Decision Making

(6) Indicator Intelligence

(7) Nuclear Environment Effects

(8) Deception Anticipation and Detection

(9) Dynamic Tactical Warfare Modeling

(10) ASW Force Modeling

(11) Inferential Network Analysis

(12) Measures of Weapon Systems Effectiveness

- b. R&D on tools to help analysts to access files, collate data, derive trends.
- c. R&D on better methods of presenting data to various levels of users in forms that will be more meaningful and useful to the users.
- d. R&D on tools for the utility of providing real-time interaction between scientists, analysts, decision makers, and their data bases.
- e. R&D to determine the trade-offs between quantity of data versus depth of analysis and how to better apportion our expenditures.

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Next 2 Page(s) In Document Exempt

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